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ABSTRACT

A study was conducted to determine how best to use APS Reading Test scores for making English placement recommendations for students at College of the Canyons (COC) in Santa Clarita, California. The primary method used to establish cut scores involves comparing success rates for contrasting groups over a range of scores. The contrasting groups are defined as successful students who earned grades of A, B, C and CR; and unsuccessful students earning grades of D, F, NC or withdrawal. The study population included 213 students from spring 1993, fall 1993 or spring 1994 enrolled in English 010 (N=15), English 034 (N=88), English 080 (N=70), or English 101 (N=40). The students were first-time college students that had taken the APS Reading Test just prior to enrolling in English. Scatter diagrams were prepared to illustrate the relationship between test scores and success in each target class. The scattergrams provide an initial basis for establishing trial cut scores to minimize placement errors. The findings of the study validated the use of the APS Reading Test to support placement decisions for students entering English 034, 080 and 101. Use of the test together with proposed placement rules could increase the rate of correct placement over the base rate by 9.1% for English 034, and 2.6% for English 101. (KP)

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INSTITUTIONAL RESEARCH

Validating Placement Rules for the APS Reading Test

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COLLEGE OF THE CANYONS

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College of the Canyons
SANTA CLARITA COMMUNITY COLLEGE DISTRICT

Validating Placement Rules for the APS Reading Test

Office of Institutional Development

September 1994

VALIDATING PLACEMENT RULES FOR THE APS READING TEST

The report entitled Predictive Validity Study of the APS Reading Test (July 1994) showed the adequate overall relationship between test scores and course grades for the APS Reading Test, supporting the use of the test scores as predictors of student performance at College of the Canyons.

The next issue is a very practical one -- how best to use the tests for making placement recommendations. This involves identifying cut scores. At what point in the continuum of test scores do we recommend placement of students in a given course? For example, are students who receive scores of 25 to 35 on the APS Reading Test fully prepared to undertake English 101 - English Composition and Literature? Should the score range be broader or narrower? No method of identifying cut scores is flawless. With typical validities of .35, only about 12 percent of the variance in student performance is associated with the test scores. A great many factors not tapped by the tests contribute to course grades. The goal of the process is to improve prediction of success.

METHOD

The primary method used for establishing cut scores involves comparing success rates for contrasting groups over a range of scores. More specifically, the contrasting groups are defined as "successful students" or those who earned grades of A, B, C and CR, whereas persons with

grades of D, F, NC or W (withdrawal) are categorized in the "unsuccessful" group. Given this distinction, it is then possible to determine the proportion of students with specific scores, and hence for score ranges, that were successful. Cut scores are then evaluated in terms of their ability to "predict" success (i.e. maximize the difference between success rates for persons scoring above a value and those scoring below it).

Subjects. The research participants were 213 students from spring 1993, fall 1993 or spring 1994. The students enrolled in English 010 (N=15), English 034 (N=88), English 080 (N=70), or English 101 (N=40). The students were first-time college students and had taken the APS Reading Test just prior to enrolling in the English course. Participating students were placed in English courses using existing placement procedures, including the use of placement test scores. End-of-course grades were used as the student performance criterion.

RESULTS

Placement Rules. The scatter diagrams presented in Figures 1 through 3 show the relationship between test scores and success in each target class. These provide an initial basis for establishing trial cut scores to minimize placement errors. On the scatter plots, a number represents one or more coincident data points while letters designate two-digit numbers, i.e. A=10, B=11, C=12 etc. Withdrawals were treated as unsuccessful course outcomes in this analysis of dichotomized grades.

Figure 1.
English 034 Success by APS Reading Test

College of the Canyons
Scatter Diagram
Data: Read SF93 - S94
Test: READING 02: APS READING A
Subgroup: TOTAL
N=88, R=0.19

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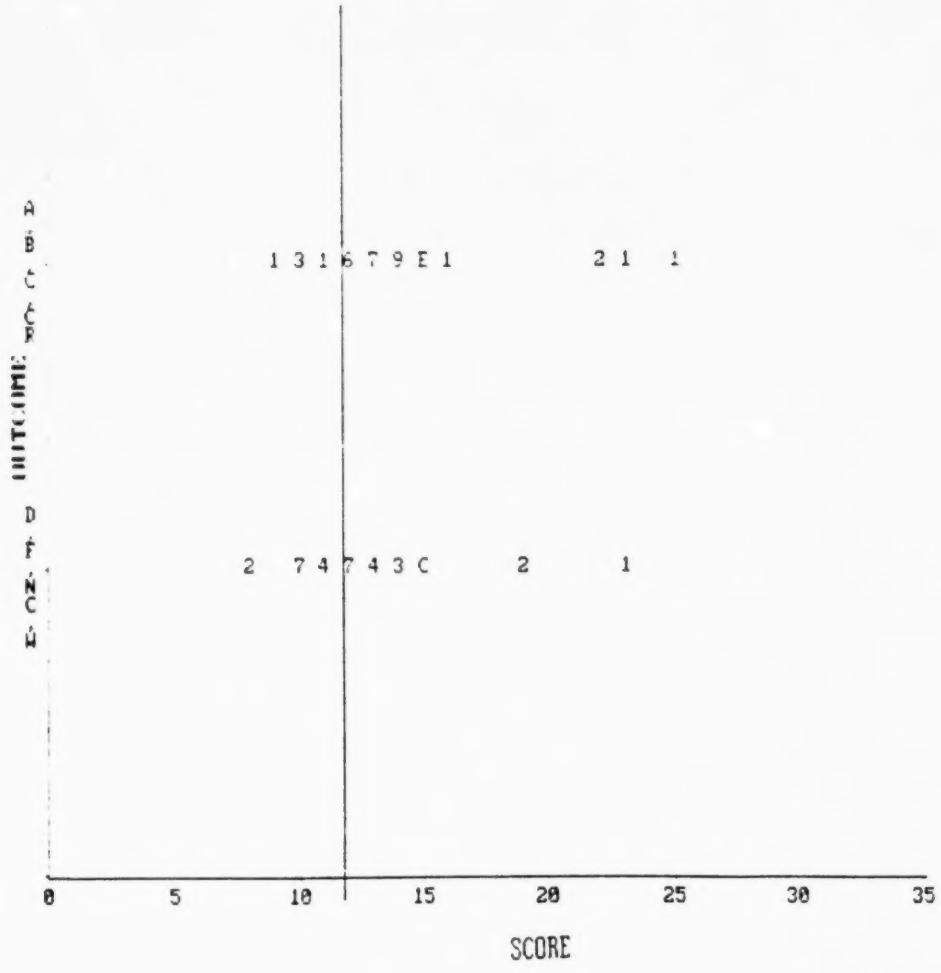

Trial Cut Score = 12

Figure 2.
English 080 Success by APS Reading Test

College of the Canyons
Scatter Diagram
Data: Read SF93 - S94
Test: READING 02: APS READING A
Subgroup: TOTAL
N=70, R=0.11

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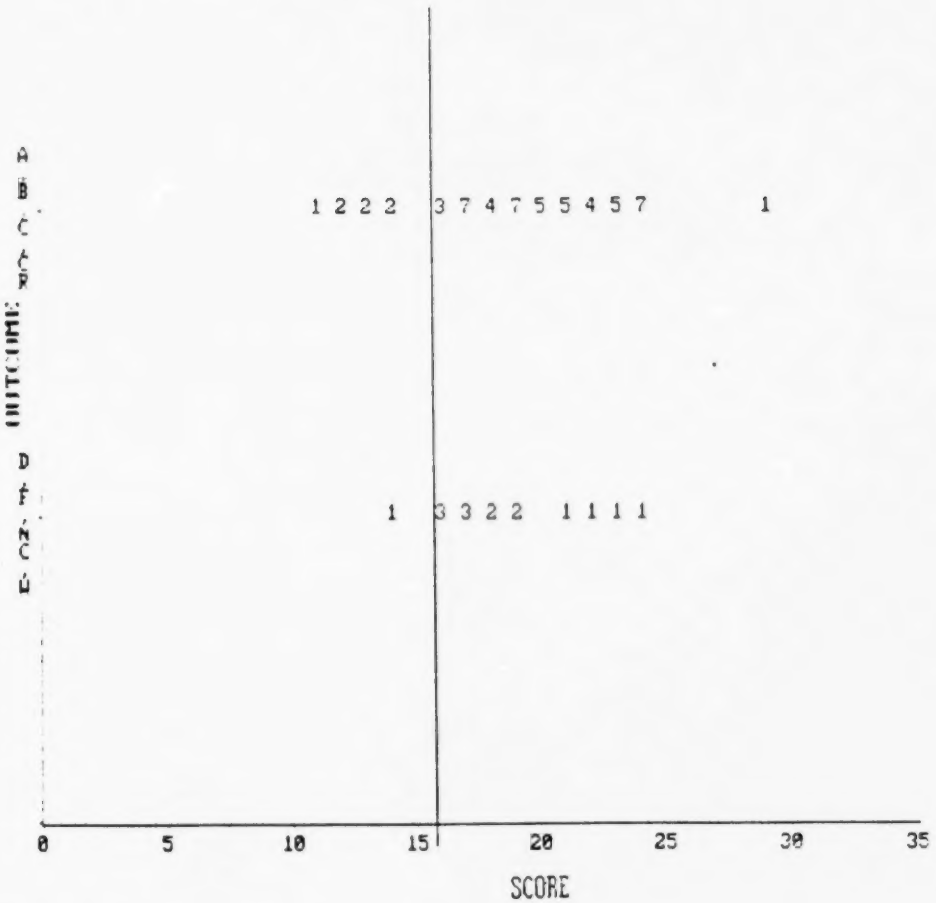

Trial Cut Score = 16

Figure 3.
English 101 Success by APS Reading Test

College of the Canyons
Scatter Diagram
Data: Read SF93 - S94
Course: English 101
Test: READING 02: APS READING A
Subgroup: TOTAL
N=39, R=-0.07

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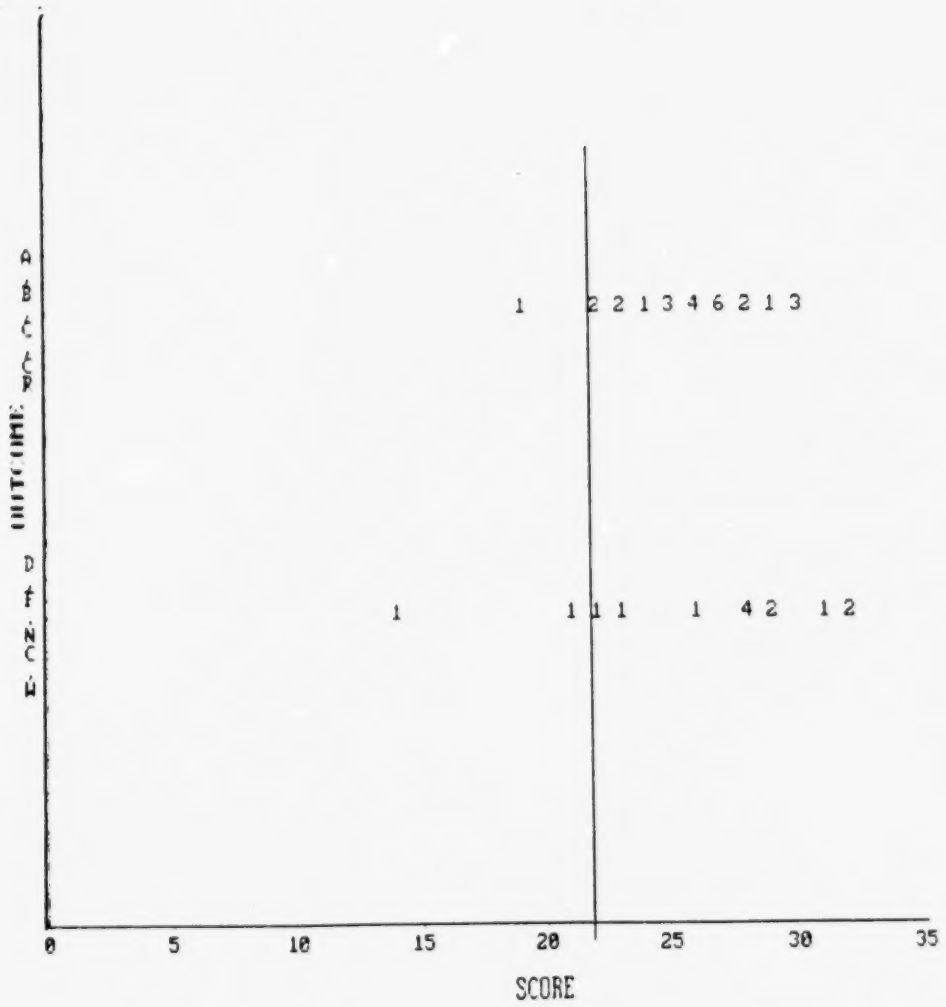

Trial Cut Score = 22

The scatterplots were partitioned using a variety of possible cut scores. The partitions produced placement classification tables for each trial cut score. Each table partitions the data from the scatterplot into four quadrants. The upper right and lower left quadrants represent correct placements. The other two quadrants represent placement errors.

The analysis showed that there were more than one set of cut scores for each course that were optimum in placement accuracy. The recommended cut scores shown in Table 1 were set in the lower part of the optimum range for each course.

Table 1.
Recommended APS Reading Test Cut Scores by Course

Test	Score Range	Recommended Placement	% of Study Sample in Score Range	N
Writing	0 - 11	English 010	15.1%	32
	12 - 15	English 034	33.0%	70
	16 - 21	English 080	22.7%	48
	22 - 35	English 101	29.2%	62

Current APS Reading Test Cut Scores By Course

Test	Score Range	Recommended Placement	% of Study Sample in Score Range	N
Writing	0 - 9	English 010	6.1%	13
	10 - 15	English 034	42.0%	89
	16 - 24	English 080	36.8%	78
	25 - 35	English 101	15.1%	32

Placement Accuracy. Tables 2 through 4 are placement classification tables that show the relationships between admission status (that would have resulted from use of the recommended placement rules) and actual student performance observed in the course. For this analysis, students were considered eligible for the course they selected if their score exceeded the cut score, even if that score would have qualified them for admission to a higher level course.

		Placement Recommendation	
		Not Eligible	Eligible
Course Outcome	Successful	A	B
	Not Successful	C	D

Correct classifications are represented in the upper right (B) and lower-left (C) cells of the table, the sum of these cells represents the total of correct placement. The percentage of correct

classifications is shown as a footnote to each table. In addition, the footnotes show the net gain in placement accuracy that would result from use of the recommended cut score and the percentage of students eligible (selection ratio) under this placement rule. A placement rule or cut score is effective when the gain in placement accuracy is significant. This gain is defined as the difference between the correct placements and the base rate, where the base rate is the number of students who would have succeeded in the course if enrollment were open (A+B). Following is an explanation of the above in formula notation:

Base Rate = (A + B)/(A + B + C + D)

Correct Placements = (B + C)/(A + B + C + D)

Gain in Placement Accuracy = Correct Placements - Base Rate

Selection Ratio = (B + D)/(A + B + C + D)

Table 2.
Percentage of Students by
English 034 Success and Admission Status

CLASSIFICATION TABLES FOR OPTIMAL CUT SCORES
Database: Read SP93 - S94 (Filter: NONE)
Course: ENGL 034
Test: READING 02: APS READING A
Subgroup: TOTAL (N = 88)

	NOT ELIG < 12	ELIGIBLE >= 12		
SUCCESS A,B,C,CR	5 5.7% r 10.9% c 27.8%	41 46.6% r 89.1% c 58.6%	46 52.3% r 100.0%	Correct Placements: 61.4% Base Rate (success): 52.3% Gain in Accuracy: 9.1%
NOT SUCC D,F,NC,W	13 14.8% r 31.0% c 72.2%	29 33.0% r 69.0% c 41.4%	42 47.7% r 100.0%	Selection Ratio: 79.5% Diff in Succ Ratio: 30.8%
	18 20.5% c 100.0%	70 79.5% c 100.0%	88 100.0%	

Table 3.
Percentage of Students by
English 080 Success and Admission Status

CLASSIFICATION TABLES FOR OPTIMAL CUT SCORES
Database: Read SP93 - S94 (Filter: NONE)
Course: ENGL 080
Test: READING 02: APS READING A
Subgroup: TOTAL (N = 70)

	NOT ELIG < 16	ELIGIBLE >= 16		
SUCCESS A,B,C,CR	7 10.0% r 12.7% c 87.5%	48 68.6% r 87.3% c 77.4%	55 78.6% r 100.0%	Correct Placements: 70.0% Base Rate (success): 78.6% Gain in Accuracy: -8.6%
NOT SUCC D,F,NC,W	1 1.4% r 6.7% c 12.5%	14 20.0% r 93.3% c 22.6%	15 21.4% r 100.0%	Selection Ratio: 88.6% Diff in Succ Ratio: -10.1%
	8 11.4% c 100.0%	62 88.6% c 100.0%	70 100.0%	

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Table 4.
Percentage of Students by
English 101 Success and Admission Status

CLASSIFICATION TABLES FOR OPTIMAL CUT SCORES
Database: Read SF83 - S94 (Filter: NONE)
Course: ENGL 101
Test: READING 02: APS READING A
Subgroup: TOTAL (N = 39)

	NOT ELIG < 22	ELIGIBLE >= 22		
SUCCESS A,B,C,CR	1 2.6% r 4.0% c 33.3%	24 61.5% r 96.0% c 66.7%	25 64.1% r 100.0%	Correct Placements: 66.7% Base Rate (success): 64.1% Gain in Accuracy: 2.6%
NOT SUCC D,F,NC,W	2 5.1% r 14.3% c 66.7%	12 30.8% r 85.7% c 33.3%	14 35.9% r 100.0%	Selection Ratio: 92.3% Diff in Succ Ratio: 33.3%
	3 7.7% c 100.0%	36 92.3% c 100.0%	39 100.0%	

The following line graphs provide a visual depiction of three of the major factors considered when selecting the appropriate cut scores: (1) percentage of correct placements; (2) percentage of false positives - or those who were eligible but who received an unsuccessful final grade; and (3) percentage of false negatives - or those who were ineligible but who received a successful final grade. One common error in selecting cut scores is to **only** look at the percentage of correct placements. By doing so, it encourages cut scores that are too high. Figures 4 through 6 show the recommended cut scores for English 034, 080 and 101.

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Figure 4.
English 034 Recommended Cut Score of 12

CLASSIFICATION TABLES FOR OPTIMAL CUT SCORES
Data: Read SF93 - S94
Course: English 034
Test: READING 02: APS READING A
Subgroup: TOTAL
N=88

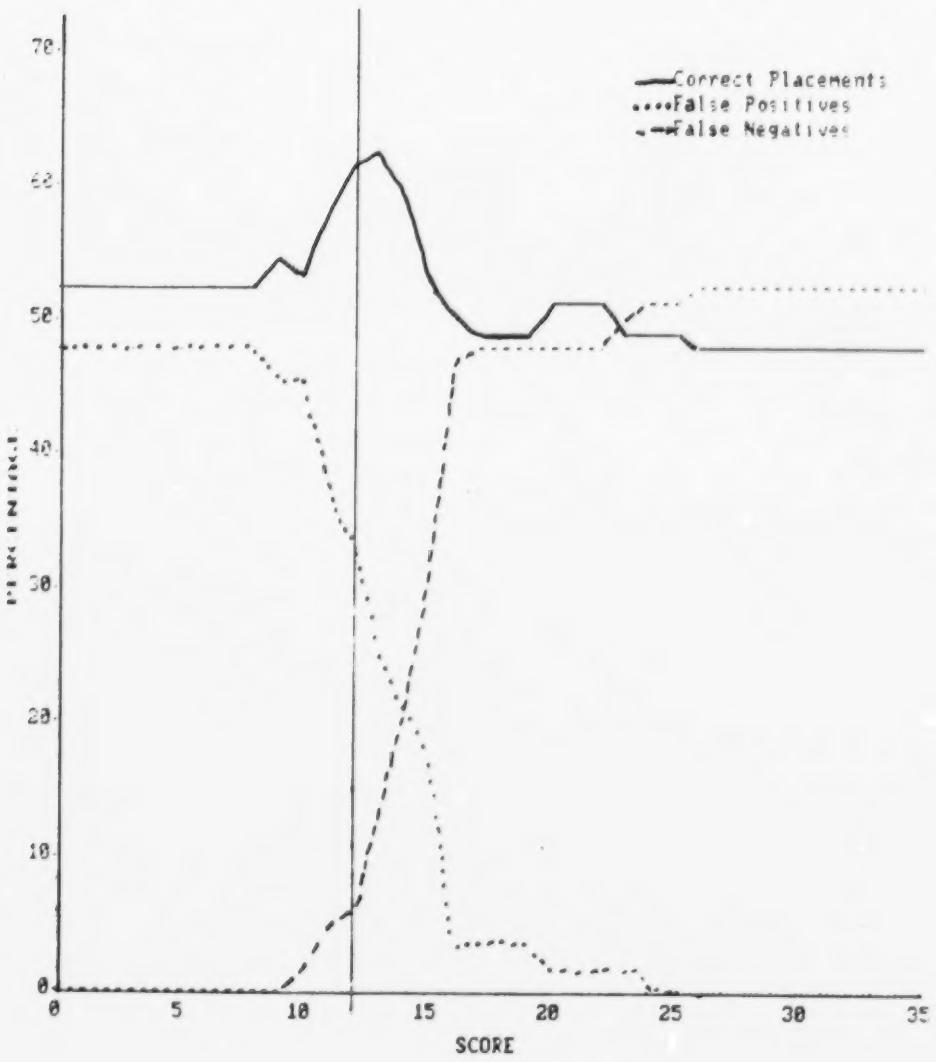

Figure 5.
English 080 Recommended Cut Score of 16

CLASSIFICATION TABLES FOR OPTIMAL CUT SCORES
Data: Read SF93 - S94
Course: English 080
Test: READING 02: APS READING A
Subgroup: TOTAL
N=70

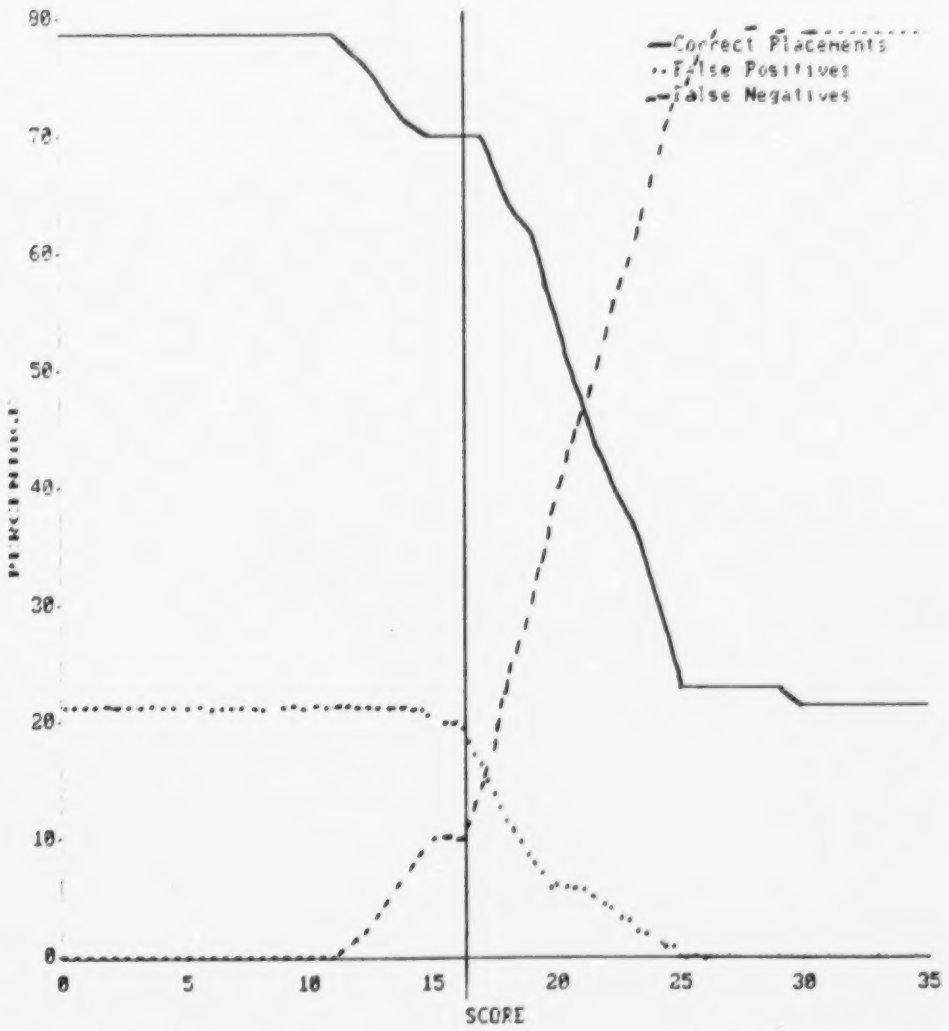

Figure 6.
English 101 Recommended Cut Score of 22

CLASSIFICATION TABLES FOR OPTIMAL CUT SCORES
Data: Read SF93 - S94
Course: English 101
Test: READING 02: APS READING A
Subgroup: TOTAL
N=39

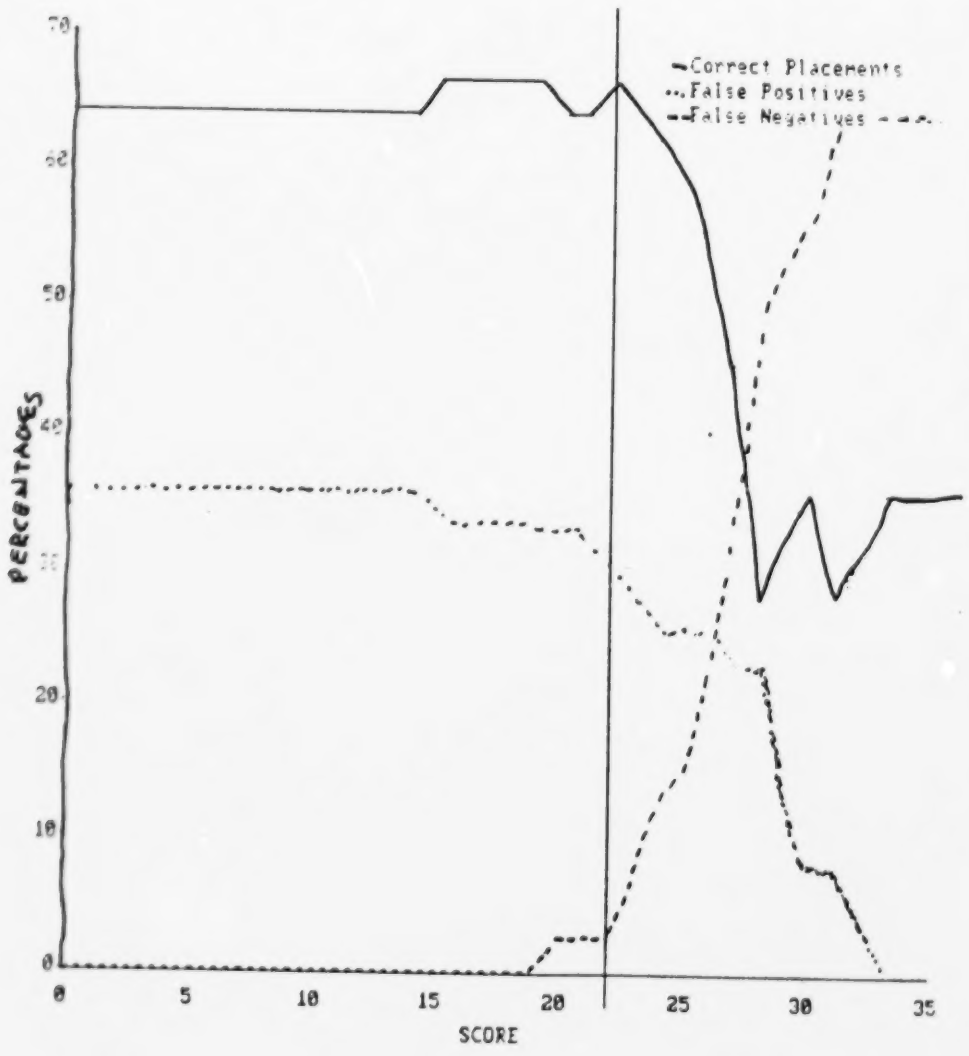

Table 5 provides supplemental information in support of the relationship between test scores and grades. Specifically, the mean test scores for key criterion (grade) defined groups -- for students earning an A or B grade, a C or Credit grade, a grade of D, F or No Credit, and those receiving Ws -- are presented. With the exception of English 101, the mean test scores for the successful students is greater than the mean values for students who earned unsuccessful grades of D, F or No Credit. The mean of 29.00, for students enrolled in English 101 who received final grades of D, F or No Credit, is based on an N of 6, a small number of cases. While the pattern is not a perfect linear relationship, these data are consistent with the overall linear relationships between test scores and course grades, and also support the reasonableness of the recommended cut score levels.

Table 5.

Mean Score for Key Grade-Based Criterion Groups, By Course

Test/Course	Final Grade Earned A/B	C/CR	D/F/NC	W
APS Reading Test				
English 010	*	11.00	*	6.00
English 034	13.86	14.36	13.00	13.15
English 080	19.40	19.35	17.71	19.13
English 101	26.38	25.50	29.00	24.63

* N is 5 or less.

Since the study sample represents only a portion of the students who actually took the APS Reading Test in the three semesters, we questioned what proportion of the total group (N = 2,755) would have fallen into each of the cut score ranges. Table 6 provides the breakdown.

Table 6.
Recommended APS Reading Test Cut Score by Course
Spring and Fall 1993

Test	Score Range	Recommended Placement	% of in Score Range	N
Reading	0 - 11	English 010	8.0%	221
	12 - 15	English 034	11.4%	313
	16 - 21	English 080	27.8%	767
	22 - 35	English 101	52.8%	1,454

A smaller percentage of the total group of test-takers fell into each of the two lower cut score ranges than was true of the study sample. Using the recommended cut scores of 22 - 35, the majority (52.8%) of all tested students would have been recommended for placement in English 101. This compares to only 29.2% of the total group - had the current cut scores been used (25 - 35).

DISCUSSION

The findings of this study validate the use of the APS Reading Test to support placement decisions for students entering English 034, 080 and 101. Use of the test together with the proposed placement rules could increase the rate of correct placement over the base rate by 9.1% for English 034, and 2.6% for English 101. There was no gain in accuracy for English 080.

A thorough review of these findings by all involved faculty and Student Services personnel is encouraged.

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